How Does Oil Move?

Observe how oil moves or migrates through rock by experimenting with water, sand and pressure. Because of its physical properties, oil flows toward the earth's surface until it reaches the surface and until it is blocked by an *impervious* rock layer or a *salt dome*. Drillers reach oil where it accumulates underground in *sedimentary rock*.

What you need:

plastic drinking water bottle, 500ml, with screw lid
120 ml of sand
60 ml of vegetable oil
100 ml of water (food coloring may be added for effect)
clear drinking straw

What to do:

1. Fill the bottle with 120 ml sand
2. Add 60 ml oil
3. Observe the oil. Does it seep into the sand or does it stay on top?
4. Poke a hole in the sand with the straw. Observe the oil.
5. Screw on lid and shake the bottle.
6. Add 60 ml water. Observe what happens. Where does the oil go? Add more water to saturate the sand. Where is the oil in relationship to the water?
7. Screw on the lid and turn the bottle upside down or shake to make the sand settle. Observe the movement or migration of the oil through the sand.

Discussion & Conclusion:

Through geological time, under heat and pressure, sand becomes compressed into sandstone, a common *sedimentary rock*. The ease that the oil flows or seeps depends upon the *porosity* of the sand. Because the oil is lighter or less dense than water, it flows to areas of less pressure, toward the surface. When a hard layer of rock keeps the oil from flowing through it, the oil accumulates. If the water pressure below it is sufficient, once the layer of rock is punctured by drilling, the oil may rise naturally to the surface. A blowout occurs if the oil rises too rapidly.